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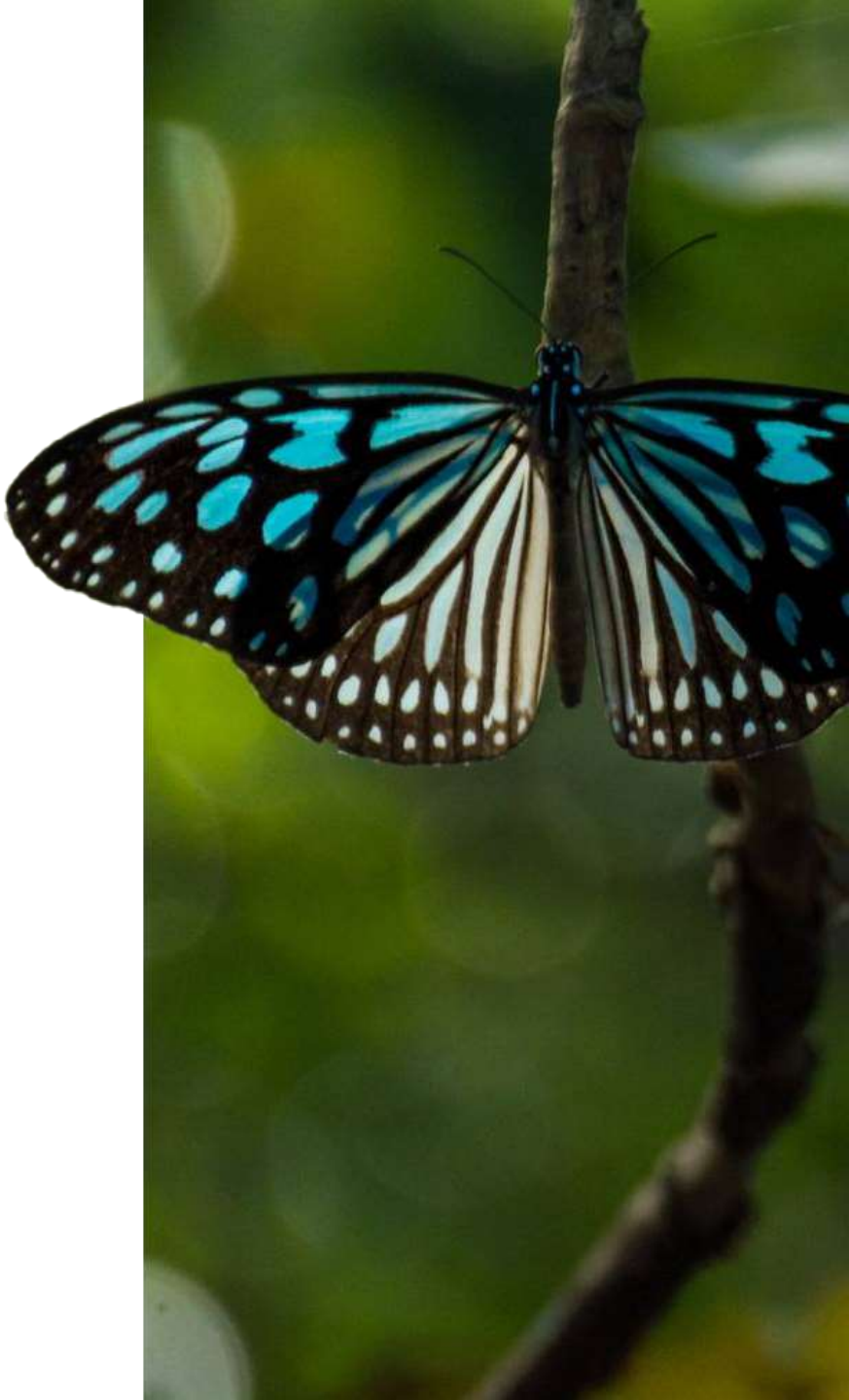
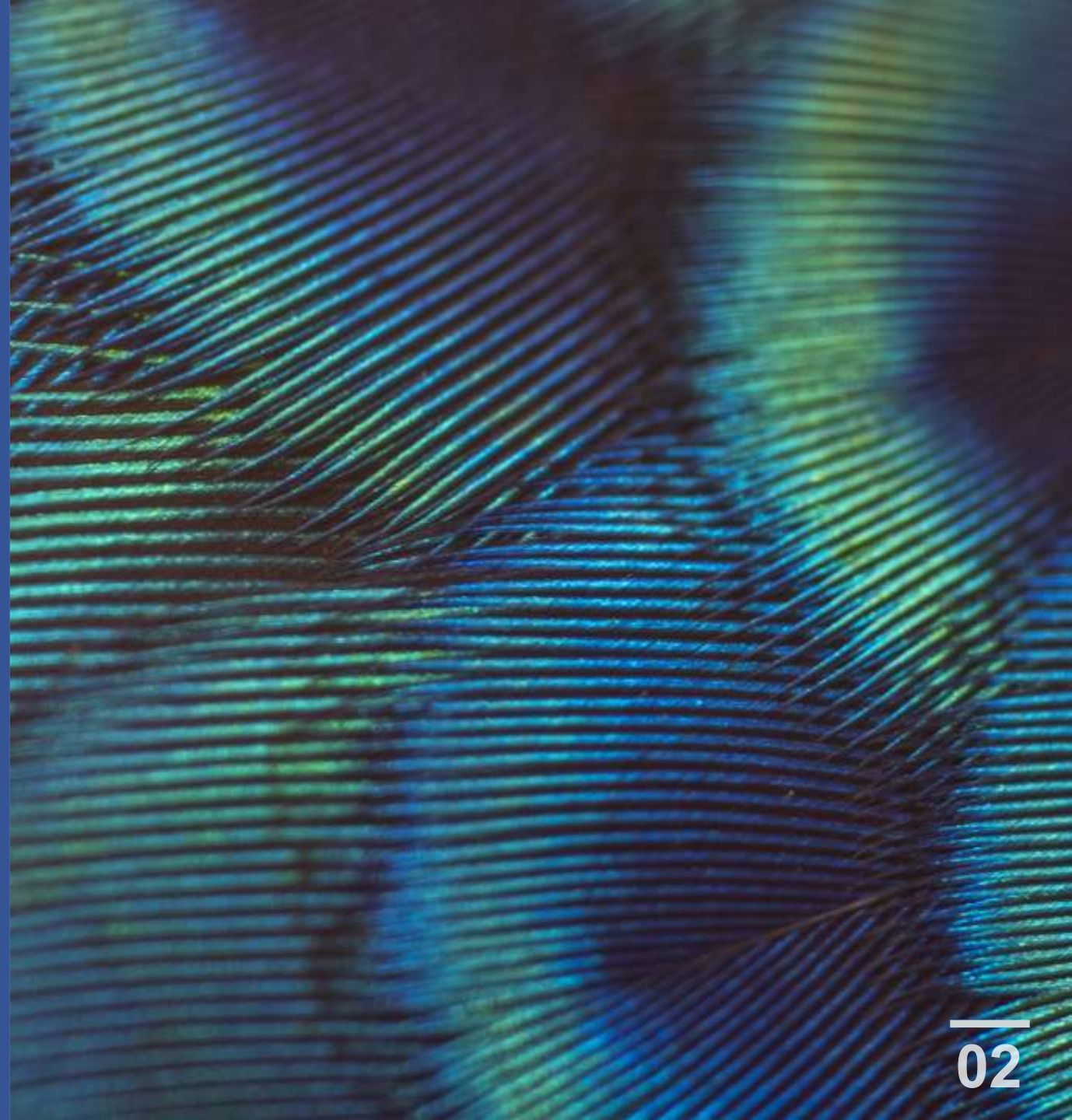
RAIN IN AUSTRALIA

Predicting Rain and Rainfall



Introduction

The issue of Climate Change is threating the existence of all humanity, it includes rising sea levels, ecosystem collapse and more frequent and severe weather. Rising temperatures from human-caused greenhouse gas emissions affects planet-wide systems causing drought and severe heat.



Problem Definition

The goal of the proposed project is to predict whether there will be rain in the next day in Australia based on the previous data gathered between 2008 and 2017, based on RainTomorrow feature we can extract a feature to predict whether it will rain during the season or not, also the rainfall feature can be used to extract an output feature that can predict the amount of water expected in a certain season.

Desired Outcome

The ability to predict rain and the amount of the rain will help farmers plan which crops to grow at which time, which will help decrease food shortage and sustain stable food supplies.

Features

Date

The date of observation.

Location

The common name of the location of the weather station.

MinTemp

The minimum temperature in degrees Celsius.

MaxTemp

The maximum temperature in degrees Celsius.

Rainfall

The amount of rainfall recorded for the day in mm.

Features Cont.

Evaporation

The so-called Class A pan evaporation (mm) in the 24 hours to 9am.

Sunshine

The number of hours of bright sunshine in the day.

WindGustDir

The direction of the strongest wind gust in the 24 hours to midnight.

WindGustSpeed

The speed (km/h) of the strongest wind gust in the 24 hours to midnight.

WindDir9am

Direction of the wind at 9am.

Features Cont.

WindDir3pm	WindSpeed9am	WindSpeed3pm	Humidity9am	Humidity3pm
Direction of the wind at 3pm.	Wind speed (km/hr) averaged over 10 minutes prior to 9am.	Wind speed (km/hr) averaged over 10 minutes prior to 3pm.	Humidity (percent) at 9am.	Humidity (percent) at 3pm.

Features Cont.

Pressure9am

Atmospheric pressure (hpa) reduced to mean sea level at 9am.

Pressure3pm

Atmospheric pressure (hpa) reduced to mean sea level at 3pm.

Cloud9am

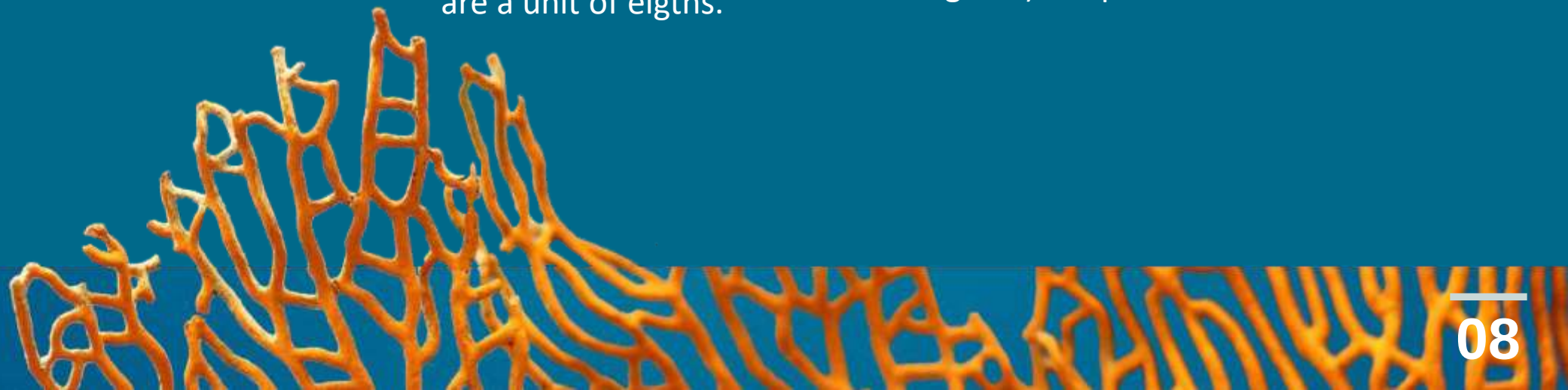
Fraction of sky obscured by cloud at 9am. This is measured in "oktas", which are a unit of eigths.

Cloud3pm

Fraction of sky obscured by cloud (in "oktas": eighths) at 3pm.

Temp9am

Temperature (degrees C) at 9am.



Features Cont.

Temp3pm

Temperature (degrees C) at 3pm.

RainToday

Boolean: 1 if precipitation (mm) in the 24 hours to 9am exceeds 1mm, otherwise 0.

RainTomorrow

The amount of next day rain in mm. Used to create response variable RainTomorrow. A kind of measure of the "risk".

Data

Preprocessing:

- Handle Missing Values
- Feature Extraction
- Detecting Outliers
  - Handling Outliers
- Split Data into Train and Test
- Handle Imbalance
- Feature Scaling

Questions:

- Does having rain today have an effect on rain?
- Does Minimum Temp have an effect on rain?
- Does Maximum Temp have an effect on rain?
- Does Sunshine have an effect on rain?
- Does WindGustSpeed have an effect rain?
- Does Humidity have an effect on rain?
- Does Pressure have an effect on rain?
- Does Minimum Temp have an effect on rainfall?
- Does Maximum Temp have an effect on rainfall?
- Does Sunshine have an effect on rainfall?
- Does WindGustSpeed have an effect on rainfall?
- Does Humidity have an effect on on rainfall?
- Does Pressure have an effect on rainfall?

Thank You